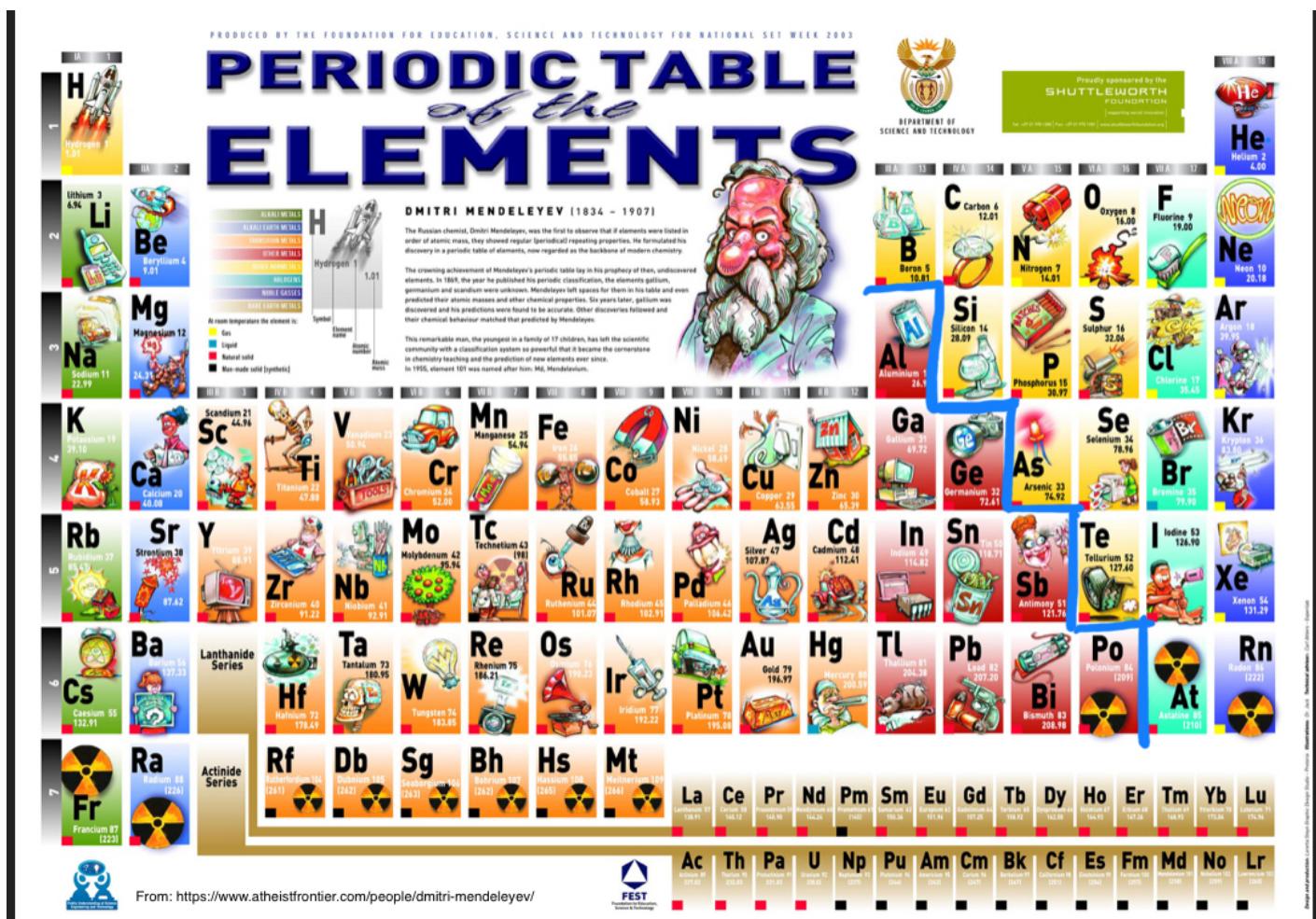


Ready? If you've read my other articles¹, you'll know that we will get into our discussion first by taking a (long-winded) look at what science has to say about our universe, and follow it up, inshallah, by referring to our favourite book, the Holy Quran (THQ).

To begin, let's start at the beginning, or at least at what science tells us is the beginning, of our universe: The Big Bang.

As you may have heard, in order to make sense of how and when everything came in to [being/existence], the brilliant minds among us, our scientific community, with each scientist working in their particular field of expertise, sometimes independently, or sometimes in collaboration with other scientists/specialists from the same and/or another field, after looking at the results of many experiments and after examining many physical phenomenon in various fields, eg. redox reactions (Chemistry), plate tectonics (Geology), cosmic background radiation (Astronomy/Astrophysics), etc., have all come to terms with the fact that all (physical) matter is made up of molecules, which are, essentially, at times, combinations of two or more types of different atoms, which, in a (chemically) pure form, are called elements.

In fact, where the elements are concerned, scientists regularly refer to a very standardized and accepted chart called The Periodic Table of the Elements:



Basically, this chart lists what scientists, over hundreds of years of careful experimentation, and after much careful and calculated verifications of their results, have been able to summarize and organize of their collective professional findings.

¹ <https://archive.org/search.php?query=creator%3A%22SMH+Razvi%22>

Essentially, every box on this table indicates one special and (mostly) naturally occurring “lego block.”

As such, and although, on its own, one block represents a blob or a chunk of some kind of material, combinations of different blocks usually result in entirely different materials altogether.

Skipping over many arduous nitty-gritty details of how it all works, we shall think of the blocks to the right side of the blue line, on the simplified PTE below, as the “negative half” of a pair of magnets, and the blocks to the left of it as the “positive half” of a pair of magnets.

As such, it becomes clear that, although it is not necessarily so, the elements on the left side of the blue line sometimes combine with those on the right “just like magnets” to form compounds/materials that we find/use in daily life.

Now, we'll take a glance at our simplified PTE, and also discuss just some common elements:

For example, a very precious element that human society values, if you'll excuse the pun, is the element Au.

“Au” is short for the Latin word aurum, which in English means gold. And that is exactly what the element in this block is: gold.

It is the same material/item that people buy/invest in for financial security, and dig out of mines or open pits, (arguably) destroying Mother Nature in the process, or “pan for” in rivers, or buy in coins, bars, etc., and also the same one that people wear as jewellery usually shaped into rings, chains, earrings, etc.

Au, aurum, or gold, is considered by scientists to be a naturally occurring pure substance; they call it an element. Aurum is really just a type of metal, which is the reason that it can be melted down and re/ shaped.

Some of the neighbouring boxes/elements to aurum, on the table above, are also elements that we know to be very useful and beneficial:

Ag - argentum, aka silver; the other precious metal, used in similar ways to aurum

Cu - copper; yet another useful metal

Ni - nickel; it was used in the minting of 5-cent money coins, that's why a 5-cent coin is called a "nickel" (in Canada, at least, eh?)

Fe - ferrum, or iron in English; it gives magnets their pull, and is a component of rust when steel is oxidized

Ti - titanium; a very strong metal

Ca - calcium; it's what's in your teeth and bones, and also found in milk

Li - lithium; it's what makes it possible to recharge cellphones once the battery drains out

K - potassium; found in bananas, it is, in mom's words, what India "feeds its soldiers to give them strength"

Ba - barium; you may have to drink some for a CT scan or ultrasound

Pb - lead; it makes the evening news when it poisons drinking water supplies, which just also happens to be how the Roman Empire died off!

(Elements that are/can be found as gases, or as liquids):

Rn - radon; a radioactive pollutant gas for which you have to get your new house tested

I - iodine; a liquid used as a disinfectant by doctors/lab assistants

Ne - neon; a type of gas used for making the colourful "open/closed" signs used by (convenience) stores, etc.

O - oxygen; a gas that we need to breathe and live

He - helium; a gas used to fill balloons, but also what gives the sun its sunshine, and its heat!

H - hydrogen; if you look up "Zeppelin blimp disaster," enough said!

All of these are examples of elements usually found/used/regarded alone, on their own.

Elements such as Na, aka sodium, and Cl, aka chlorine, together, are an example of a very commonly occurring and well-known compound that we use every day: salt, the same one we add to food to make it taste better, and also try to avoid if blood-pressure gets too high.

Salt is a combination of two elements, which, on their own, look and behave very differently; for further details, looking each one up on the internet may prove interesting and beneficial.

C - carbon; it is found in everything that is considered organic or (an) organic compound(s), and, on its own, as graphite in pencils (i.e. pencil lead), hockey sticks, and the hulls of state-of-the-art airplanes

At the bottom of the table, and, once again, skipping over the arduous details involved about the reasons for it, we find the elements:

Pu - plutonium; what Kim Jon II, the North Korean, and, possibly, DJ Trump, if he's re-elected, can use to turn our beautiful blue and green Earth into, may Allah forbid, a barren and desolate planet Mars "2.0"

U - uranium; the "enriched" version of which eventually breaks down into plutonium, and in the hands of crazy politicians, regardless of their respective home country, almost begs us to beg the question: why can't we all just get along?

So what does all this have to do with the big bang?

Well, after becoming familiar with some common elements, per what has been said so far, it has everything to do with the big bang!

First, it must be mentioned that each element/box/block, including the ones we have talked about so far, all have a unique number, and are arranged in a proper sequence on the periodic table.

The numbers, (currently) go from 1 to 118, with other new elements being added once they are found and/ or created in the lab.

The first element, element number one, is H - hydrogen, found at the top left corner of the table, but the next one, element number two, He - helium, is found at the top right corner. From there onwards, the sequence is pretty smooth. Again, there are good reasons behind the shape of the table, and for the location of the elements on it, but getting into the details would take a long(er) time.

To squash any curiosity, and because it is also beneficial for our discussion to know it, the element numbers for the ones we have discussed so far, are as follows:

Au 79, Ag 47, Cu 29, Ni 28, Fe 26, Ti 22, Ca 20, K 19, Li 3, Ba 56, Pb 82, Rn 86, I 53, Ne 10, O 8, Na 11, Cl 17, Pu 94, U 92, C 6, He 2, H 1

So, what's so important about the element's number? Lots!

As mentioned before, all elements have unique numbers that put them in a very ordered, and specific sequence on the table of elements. This knowledge helps scientists, especially Particle Physicists, in drawing up some serious conclusions.

They explain that the ordering and sequencing of elements on the table is based on experiments and results which show that, for each element, its number indicates how many single atoms, called protons, can be found in its central core.

For our casual purposes, to understand how things look inside the core of an atom, it helps make things easier if we think of a bag full of marbles or ballbearings, i.e. a bunch of tiny spheres, all pressed tightly together.

So, for each element on our list, the number of "marbles/ballbearings" in the central core of each element is indicated by that element's number. This means:

-one atom of Ca has 20 marbles/ballbearings in its central core,

-one atom of Au has 79, etc.

A point to remember is that you need to have a whole bunch of atoms to make even 1 gram of an element. That means, in 1 gram of Au, there a whole bunch of individual atoms, with each atom itself containing a bag of 79 marbles/ballbearings in its central core. This same idea applies to 1 gram of Ca, or any other element on the table, but with regard to its own specific sequential number.

All of this is important to know because scientists use this knowledge to draw several important conclusions.

One conclusion is that each element has its own specific characteristic spectral lines that it exhibits. This means, essentially, that each element has its own unique "fingerprint" by which scientists can identify it.

Another conclusion, finally getting us back on track with our main topic, because of the consistent observations scientists make and the results that they regularly obtain, is that the elements with the larger numbers are, essentially, all derived from the most basic element of all: element number one, hydrogen.

One proof they have for drawing this conclusion is that, when they look at our sun, and use their advanced techniques to analyze the sunlight that they see, fingerprints for both hydrogen and helium show up in the data that they collect.

The explanation they give for this phenomenon is that, due to the sun's size and the gravity that it has, as the sun formed millions of years ago, it first turned into a ball of only just hydrogen.

Gradually, over millions of years, because the forces of gravity and the unbelievable pressures found inside the sun's core, and especially at its very dead-center, the hydrogen atoms started to combine with other hydrogen atoms to form helium, a new "heavier" element.

They say that two hydrogen atoms, both with one atom each in their core, become pressed together with each other, resulting in the formation of one helium atom that now contains two atoms, or "marbles/

“ballbearings” in its core, and which now behaves very differently compared to the hydrogen from which it came.

Skipping over the technical details, it is enough to understand that this on-going process always happens within the sun’s core, and that this phenomenon is repeated so ridiculously much that it gives our sun both its shine, as well as all the heat that it gives off. This same idea also applies to all the rest of the stars that we can see in the universe, without exception.

The scientists go even further, and based on more observations and verified experiments, say that, after helium is created, such processes go on until the next element, carbon, and then the next element after that, oxygen, and then the next element, silicon, and then the next and final element, iron, form inside the sun’s core. Keep in mind that this whole entire process takes millions of years to happen, and that the elements that form can vary depending on the actual mass of the sun being observed. By the way, the sun is a star.

Once iron starts to form in the sun’s core, things become dangerous. Scientists say that, depending on the actual size and composition of the sun, it can either turn into a white dwarf, if it swells up and sheds its outer layers, or, if it explodes, it can turn into either a neutron star, or a black hole. In cases where there is an explosion, that’s what helps scatter the elements that have formed in the core to every corner of the universe; Planets are formed once this scattered material, eventually, clumps together.

Skipping over more nitty-gritty details, scientists say that it is because these kinds of processes, and also because of much more horrific events like two blackholes or two neutron stars crashing together, that we are able to find elements heavier than iron. Heavier elements, again, just means that there are more marbles/ballbearings at the core of one element, which makes it heavier than one which has less in its core. For example, aurum’s number is 79, versus that of calcium which is 20, etc.

For the purposes of our discussion, knowing all this helps us understand the present condition of the universe in which we live; our environment.

But, because we now know what elements are, and how they formed, and that our scientists have found a whole “table full” of them, wouldn’t it also be nice to know how things started in the first place? Enter the big bang theory.

The big bang theory is, essentially, an explanation and a way of trying to make sense, in a logical fashion, about how the physical universe came into existence.

It basically says that, approximately 14 billion years ago, something happened that caused a kind of very hot, dense, and tiny sphere to form.

That sphere then expanded very fast, and lots of particles that are smaller than atoms, with their own sequences and stages, went through some ultra fast changes.

The result was that, after millions of years, conditions eventually “normalized,” but the whole universe at that time was mostly just hydrogen and helium. The current understanding is there was about 75% hydrogen and 25% helium, with some small percentages of other lighter elements. But, it was all the direct result of single protons joining together in some way or another. Recall that an element’s number tells you how many marbles/ballbearings can be found in the core of an atom. So, if there is only one proton in the core, then that element is hydrogen.

Obviously, to science anyway, the current state of the universe, along with all the naturally occurring heavier elements that we find on the PTE, is a direct result of those basic particles being combined, modified, and recycled by the natural forces in the universe, as it continued to expand and develop, ie. per what we said before about suns exploding, and the collisions of blackholes and neutron stars.

And, even after so much time has passed, and perhaps due to the logical way in which our current scientific knowledge tells us that things have played out, it just makes it that much more clear to us, especially as Muslims, about what our Holy Quran says in this regard:

Whenever Allah wants something to happen, He says “Be!,” and so it is!
Ch 36:82

There is also another very interesting verse comes from surah YaSeen verse 80:
[Allah] is the one who made things such that you can get a [warm] burning fire out of a [lush] green tree, which you burn as firewood.

As straight enough as this verse may seem, i.e. that you get a fire when you chop down a tree and use it for firewood, there is a HUGE underlying point that may not be so obvious: the energy that is released in that fire.

Where does that energy, the fire and warmth that we get from burning firewood, actually come from?
Answer: the big bang!

Yes, although it may have happened almost 14 billion years ago, all the energy that is currently found in the universe, including the one in your phone, microwave, stove, light bulb, i.e. everything you can possibly find in the entire universe, all that energy comes directly from the big bang. So in burning that firewood, you are actually releasing very old energy (and benefiting from it)!

In fact, there is another ayah which, after our discussion so far, becomes even more profound-in a scientific way at that-and it says:

So then let man [يَنْظُر]-look at; i.e. think deeply] about the food that he eats
80:24

This verse is usually presented to get you to count the blessings that you (may) have taken for granted, i.e. the variety of food to which you have access, and can eat every day. Well, with the connection to the big bang, the meaning of this verse becomes doubly profound:

First, in terms of the energy, referred to as “calorie” when talking about food, as you may now have realized, the energy you get from your food also comes from the big bang.

Second, and even more profound, is that, as science would testify, you and all the food that you will ever eat, when you think in terms of the energy involved, was, in fact, all created at the exact same time! And that also goes the same for anything and everything else found in the entire universe! All the energy contained or released by anything existing in the universe right now, or by anything that will exist at some time in the future, comes from the big bang that happened 14 billion years ago.

In the book Tawhid Muffadal, our 6th Imam, Jafer Al-Sadiq ؑ, says:

Allah (swt) is far above what they attribute to Him. May [the unbelievers (in God)] perish! How misguided they are! In their misguided blindness and bewilderment they are like blind people groping right and left in a well-furnished, well-built house with fine carpets, luscious articles of food and drink, various kinds of clothing and other necessities of essential use, all adequately supplied in proper quantity and placed with perfect decorum and ingenious design. In their blindness they fail to see the building and its furnishings. They move about from one room to another, advancing and retreating. If by chance, any one of them finds anything in its place to supply a need, and not knowing the purpose for which it is set there and unaware of the underlying ingenuity, he might begin to reprimand the architect of the building in his offensive rage, whereas, as a matter of fact, the fault lies with his own inability to see. (p.7-8, wilayatmission.com)

So, we can then conclude, based on all the elements and forms of energy with which we interact directly, in one way or another, in our daily lives, that, indeed, we, and every single atom of every single element found in our universe-existing at this very instant in time-as far as our science and the brilliant scientific minds amongst us prove and can attest to, combined with what the Holy Quran says in 36:82, was **all created at the same time!**

So, the next time you catch yourself:

- becoming alert and aware of the nutrition facts label on the food/drink you buy, or

- of the energy rating on an electronic device you use, or
- about the amperage/wattage or lumens, etc., of a lightbulb you plug in, or
- if you read a list of ingredients on a box of crackers and come across a weird sounding one like monocalcium phosphate, or
- if you wash and polish the chrome rims and trim on your car, or
- when you clean a paper cut, and put some ointment on it and cover it with a bandage, or
- when you dry your wet hair with a hairdryer, or
- when you enjoy a cool breeze on a hot day, or
- when you surf a gigantic wave, or
- when you clip and file your fingernails, or
- when you catch a fly ball in the stands, or
- when you drink a sip of water (aka H₂O because of its molecular formula, i.e. meaning that in every molecule of water there is 1 atom of Oxygen, and 2 atoms of Hydrogen....mmmm, savour that double 13+ billion year old punch of 'fresh and refreshing taste' them Hydrogen atoms add to the mix!)

or

- when you do anything at any point in your day,

...make sure you take the time to think and appreciate the moment of the big bang, when Allah ﷺ said "Kun!," and everything was created.

For all these reasons, we can confidently say that science proves [كُنْ فَيَكُنْ] -Kun Fayakun], which means that science proves: Allah says "Be!," and so it is!

Subhanallah!

Was-Salam,

Your Brother in Faith,

SMH Razvi

PS:

Just as an aside, regarding what particle physicists currently have to say about our universe, they're leaning toward the idea that all physical matter pops up because of the way in which different kinds of energy waves/fields interact with each other, across various dimensional planes. For them, specifically, their "PTE" consists of 12 "subatomic particles," and 4 "fundamental forces," all of which have been proven to exist by experimentation. But, it all still goes back to the way things started at the instant of the big bang.

PPS:

It should also be noted that in our ahadith, as found in the book Al-Kafi by Sheik Al-Kulani, RA, it is said that the light of the Holy Prophet ﷺ was the first creation Allah ﷺ created, and it was then split in half so as to create the light of Amir Al-Momineen ع. From there the light of Imam Hasan ع was created from the Amir ع's half, and the light of Imam Hussain ع was created from the Holy Prophet ﷺ's half. There are further details to this hadith, and even more material in this regard. Allahma Al-Majlisi RA's book Hayat Al-Quloob also has similar material. Both scholars' books can be found online.